Claims

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CLAIMS:

1.   A method of transmitting packets of data in a communication network comprising at least first to third stations, the method comprising the steps of:-

    sending a first number of the data packets from the first station to a second station;

    identifying which of the first number of packets are correctly received by the second station from the first station; and

    sending a second number of data packets from the third station to said second station commencing with the a packet identified as being required after the last correctly received packet received from the first station.

2.   A method as claimed in claim 1, wherein said network comprises a common node connected to said first and third stations, said common node being arranged to transmit data packets to said first and third stations.

3.   A method as claimed in any preceding claim including the step of acknowledging by the second station correct receipt of that data packet by the second station.

4.   A method as claimed in any preceding claim, wherein the last packet correctly received by said second station from the first station is identified and the packet subsequent to the last correctly received packet is transmitted by the third station.

5.   A method as claimed in any of claims 1 to 4, wherein at least some of the packets of data to be transmitted to the second station are provided both to the first and third stations.

6.   A method of transmitting packets of data in a communication network comprising at least first to third stations and at least one common node, said second station arranged to be in communication with at least one of said first and third stations

and said first and third stations being connected with said common node, the method comprising the steps of:

indicating to a common node that the second station is reachable via both of said first and third stations;

transmitting the same data packets from the common node to the first and third stations;

transmitting the said same data packets from at least one of the first and third stations to said second station;

identifying a received packet at the third station and acknowledging receipt of that packet; and

removing said acknowledged packet from data storage means.

7. A method as claimed in claim 5 or 6, wherein data packets are provided both to said first and third stations when the second station has at least one predefined parameter with respect to said first and third stations.

8. A method as claimed in claim 7, wherein said predefined parameter is defined by the geographic position of the second station with respect to the first and third stations.

9. A method as claimed in claim 7, wherein said at least one predefined parameter is defined by at least one parameter of signals received from at least one of said first and third stations satisfying a predetermined criteria.

10. A method as claimed in claim 9, wherein said signal parameter is the power level of a signal received at the second station from at least one of said first and third stations.

11. A method as claimed in claim 9 or 10, wherein said signal parameter is the ratio of power level of signals received at the second station from the first and third stations.

12. A method as claimed in claim 9, 10 or 11, wherein said signal parameter is the quality of the signal received at the second station from at least one of said first and third

stations.

13. A method as claimed in any of claims 9 to 12, wherein said
signal parameter is the quantity of traffic associated with at
least one of said first and third stations.

14. A method as claimed in any of claims 7 to 13, wherein said
predefined parameter is the quality of signals associated with
at least one of said first and third stations.

15. A method as claimed in any of claims 7 to 14, wherein said
parameter is averaged over time before it is determined if said
criteria is satisfied.

16. A method as claimed in any of claims 7 to 15, wherein said
predefined parameter defines a handoff zone in which said first
station hands off to said third station in that second station
stops receiving data packets from said first station and starts
receiving data packets from said third station.

17. A method as claimed in claim 16, wherein said handoff zone
is surrounded on either side by a zone in which the second
station receives data packets from a respective one of said first
and third stations and said first and third stations are provided
with the same data packets.

18. A method as claimed in any preceding claim, wherein when
handoff takes place, said second station transmits a signal to
the third station to advise the third station of the which
packet or packets were received from the first station and said
third station transmits the data packet identified as being
required after the last packet to said second station.

19. A method as claimed in any preceding claim, wherein if said
second station does not correctly receive a data packet, said
second station requests retransmission of said data packet.

20. A method as claimed in any preceding claim, wherein data packets are stored in at least one of the first and third stations when provided thereto.

21. A method as claimed in claim 20, wherein when handoff takes place, the data packets preceding said next data packet to be transmitted are discarded in said third station.

22. A method as claimed in claim 2 and 3 or claim 6 or any claim when appended thereto, wherein said acknowledgement is transferred to the common node.

23. A method as claimed in claim 2 or 6 or any claim appended thereto, wherein the common node associates a unique number for each packet and the same data packets, each of which is associated with the unique number are transmitted from said common node to both of the first and third stations.

24. A method as claimed in claim 2 or 6 or any claim appended thereto, wherein the common node controls the removal of said identified data packet from the or each data storage means.

25. A method as claimed in claim 2 or 6 or any claim appended thereto, wherein said first station is in communication with a first node and the third station is in communication with a second node, said first and second nodes being in communication with said common node.

26. A method as claimed in claim 25, wherein the acknowledgement is forwarded to the common node by one of said first and second nodes and the common node advises the other of the first and second nodes that an acknowledgment has been received.

27. A method as claimed n claim 2 or 6 or any of claims 3 to 5 or 7 to 24 when appended thereto, wherein the first station is connected to a first node and the third station is connected to a second node and one of the first and second nodes is arranged

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to be the common node and said acknowledgements are forwarded to the common node.

28. A method as claimed in any of claims 25 to 27, wherein the first and second nodes and/or the first and third stations are connected together.

29. A method as claimed in claim 2 or 6 or any of claims 3 to 5 or 7 to 24 when appended thereto, wherein the first and third stations are connected to the common node via a network.

30. A method as claimed in claim 2 or 6 or any claim when appended thereto, wherein data storage means is provided in said common node.

31. A method as claimed in any preceding claim, wherein said network is a wireless network.

32. A method as claimed in any preceding claim, wherein said first and third stations are base stations.

33. A method as claimed in any of claims 1 to 31, wherein the first and third stations are base station controllers.

34. A method as claimed in claim 2 or 6 or any claim when appended thereto, wherein said communication network is a general packet radio system and said common node is a SGSN.

35. A method as claimed in claim 34, wherein the first and third stations are in communication with different SGSNs, one of said SGSNs being designated as the common node, the other SGSN being arranged to forward acknowledgements to the common node.

36. A method as claimed in any of claims 2 or 6 or any of claims 3 to 5 or 7 to 31, wherein said communication network is a GPRS network, said first and second stations are SGSNs and said common node is a GGSN.

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37. A method as claimed in any of claims 34 to 36, wherein packets of data are forwarded to at least one SGSN prior to any connection being established with said second station.

38. A method as claimed in claim 2 or 6 or any of claims 3 to 5 or 7 to 33, wherein said common node is a base station controller.

39. A method as claimed in claim 2 or claim 6 or claim appended thereto, wherein the common node is not advised of the occurrence of handoff.

40. A method as claimed in any preceding claim, wherein said second station is a mobile station.

41. A method as claimed in any one of the preceding claims, wherein said communication network has a plurality of cells or areas and said second station is able to register with one or more cells or areas of said network at the same time.

42. A method as claimed in any preceding claim, wherein packets of data are forwarded to at least one of said first and third stations before a connection is made with said second station.

43. A system of transmitting packets of data in a communication network comprising:- first, second and third stations, wherein said first station is arranged to send a first number of the data packets to the second station, the second station is arranged to identify the which of the first number of packets it receives from the first station, and the third station is arranged to send a second number of data packets to the second station commencing with the data packet identified as being required after the last correctly received packet from the first station.

44. A system as claimed in claim 43, wherein said first and third stations comprise storage means for storing data packets prior to transmission to said second station.

45.   A system as claimed in claim 44, wherein said storage means comprises a buffer.

46.   A system as claimed in claim 43, 44 or 45 wherein the second station is arranged to determine the last packet correctly received by the second station from the first station and the third station is arranged to transmit the packet subsequent to the last correctly received packet to the second station.

47.   A system as claimed in any of claims 43 to 46, wherein the first and third stations are both provided with at least some of the same data packets for transmission to said second station.

48.   A station for use in a communication network, said station being arranged to transmit packets of data to a second station, said second station being arranged first to receive a first number of packets from a further station, wherein said station is arranged, in use, to transmit a second number of data packets to the second station commencing with the data packet identified as being required after the last correctly received packet received by the second station from the further station.